Carbon Bubbles

Data: Institute estimate

Operating 2017-2020

- 1Mtpa of CO2 (areas of circle are proportional to capacity)

* Injection currently suspended
*** Institute estimate
Carbon Capture Operational Milestones

**Boundary Dam CCS Project**
Over one million tonnes of CO₂ captured and used mainly for enhanced oil recovery

**Quest**
Over one million tonnes of CO₂ captured and stored in a deep saline formation

**Air Products Steam Methane Reformer EOR Project**
Three million tonnes of CO₂ captured and used for enhanced recovery

**Petrobras Santos Basin Pre-Salt Oil Field CCS Project**
Three million tonnes of CO₂ injected into producing reservoirs

**Sleipner CO₂ Storage Project**
20 years of successful operations, over 18 millions tonnes of CO₂ stored

**Jilin Oil Field EOR Demonstration Project**
Over one million tonnes of CO₂ injected
Carbon Capture Project Startups

**Petra Nova Carbon Capture Project**
Operations imminent

**Kemper County Energy Facility**
Operations imminent

**Illinois Industrial CCS Project**
Nearing operations

**ACTL**
Capturing CO₂ from multiple industrial sources for EOR; late 2017 start

**ROAD**
New storage site permitting, confidence for project progression heightened

**Abu Dhabi CCS Project**
World’s first operational CCS project in the iron and steel sector

**Norway Full Chain CCS Project**
2017 budget supports full-chain CCS project

**Yangchang Integrated CCS Demonstration Project**
Approaching final investment decision

**Tomakomai CCS Demonstration Project**
Japan’s first fully integrated CCS Project

**Gorgon Carbon Dioxide Injection Project**
Operations anticipated late in the first half of 2017
# Alberta Carbon Trunk Line

## Project Proponent

<table>
<thead>
<tr>
<th>Project Proponent</th>
<th>Enhance Energy</th>
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<tbody>
<tr>
<td>Anchor Sources</td>
<td>• Northwest Redwater Refinery</td>
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<tr>
<td></td>
<td>• Agrium Fertilizer Plant</td>
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<tr>
<td>Pipeline</td>
<td>• 150 miles</td>
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<tr>
<td></td>
<td>• Capacity -14.6 MTPA</td>
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<td></td>
<td>• Initial Flow – 1.6-2.0 MTPA</td>
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<tr>
<td>Developer Role</td>
<td>• Compression at refinery and fertilizer plant</td>
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<tr>
<td></td>
<td>• Pipeline</td>
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<td></td>
<td>• EOR</td>
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<tr>
<td>Funding</td>
<td>• CA$495 million from Province of Alberta</td>
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<td>• CA$63 million from Government of Canada</td>
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</tbody>
</table>
What can we do?

- Strengthen the science
- Exit the echo chamber – expand the tent
- Advocate for policy support
- Encourage business leaders to invest in carbon capture
Actual and expected operation dates for projects in operation, construction and advanced planning

Power Generation

Coal-to-liquids

Chemical production

Iron and steel production

Synthetic natural gas

Fertiliser production

Oil refining

Natural gas processing

Hydrogen production

- 1Mtpa of CO₂ (areas of circle are proportional to capacity)

* Injection currently suspended
** Storage options under evaluation
*** Institute estimate